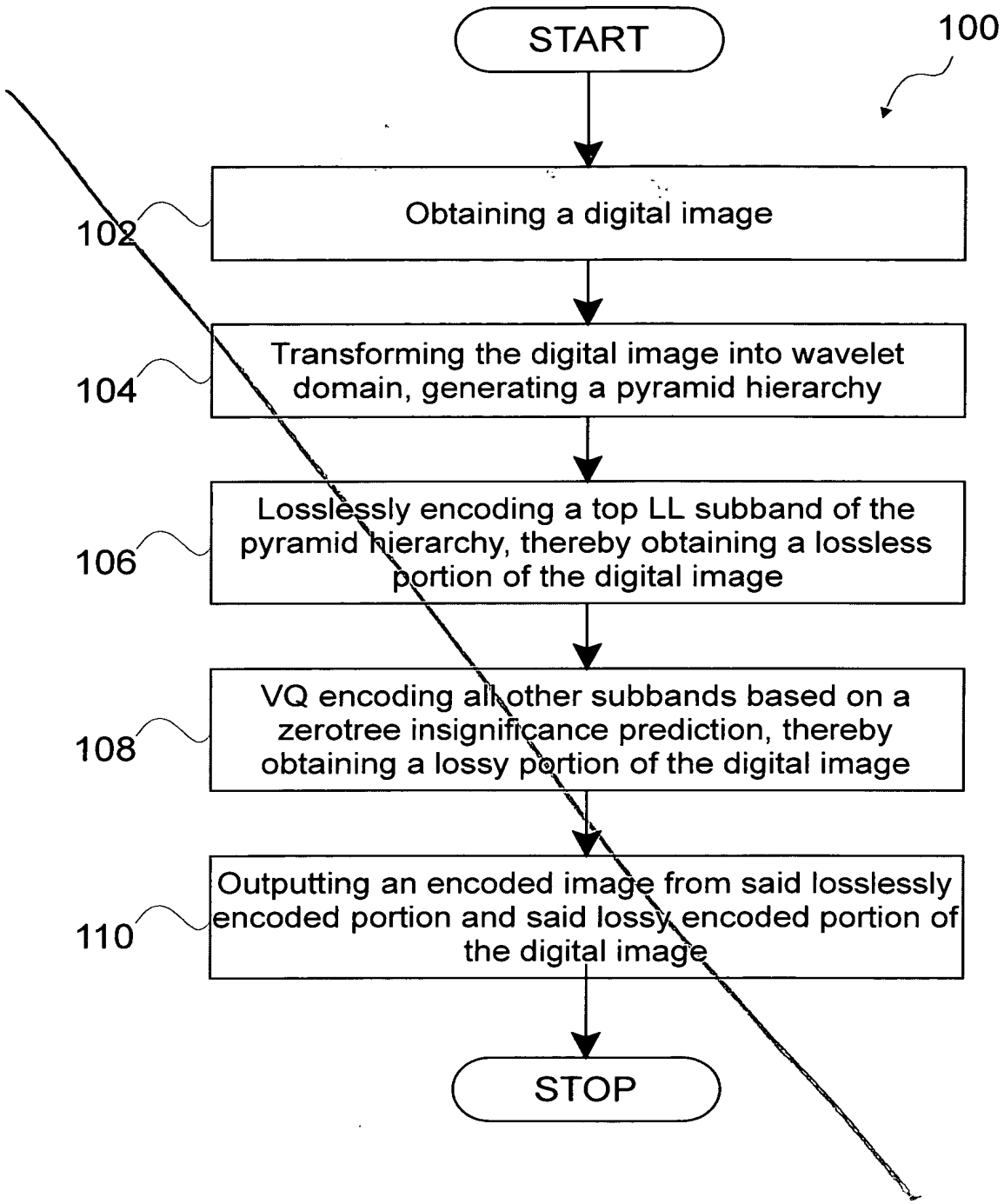
START
100
Obtaining a digital image
102
Transforming the digital image into wavelet domain, generating a pyramid hierarchy
104
Losslessly encoding a top LL subband of the pyramid hierarchy, thereby obtaining a lossless portion of the digital image
106
VQ encoding all other subbands based on a zerotree insignificance prediction, thereby obtaining a lossy portion of the digital image
108
Outputting an encoded image from said losslessly encoded portion and said lossy encoded portion of the digital image
110
STOP

FIG. 1

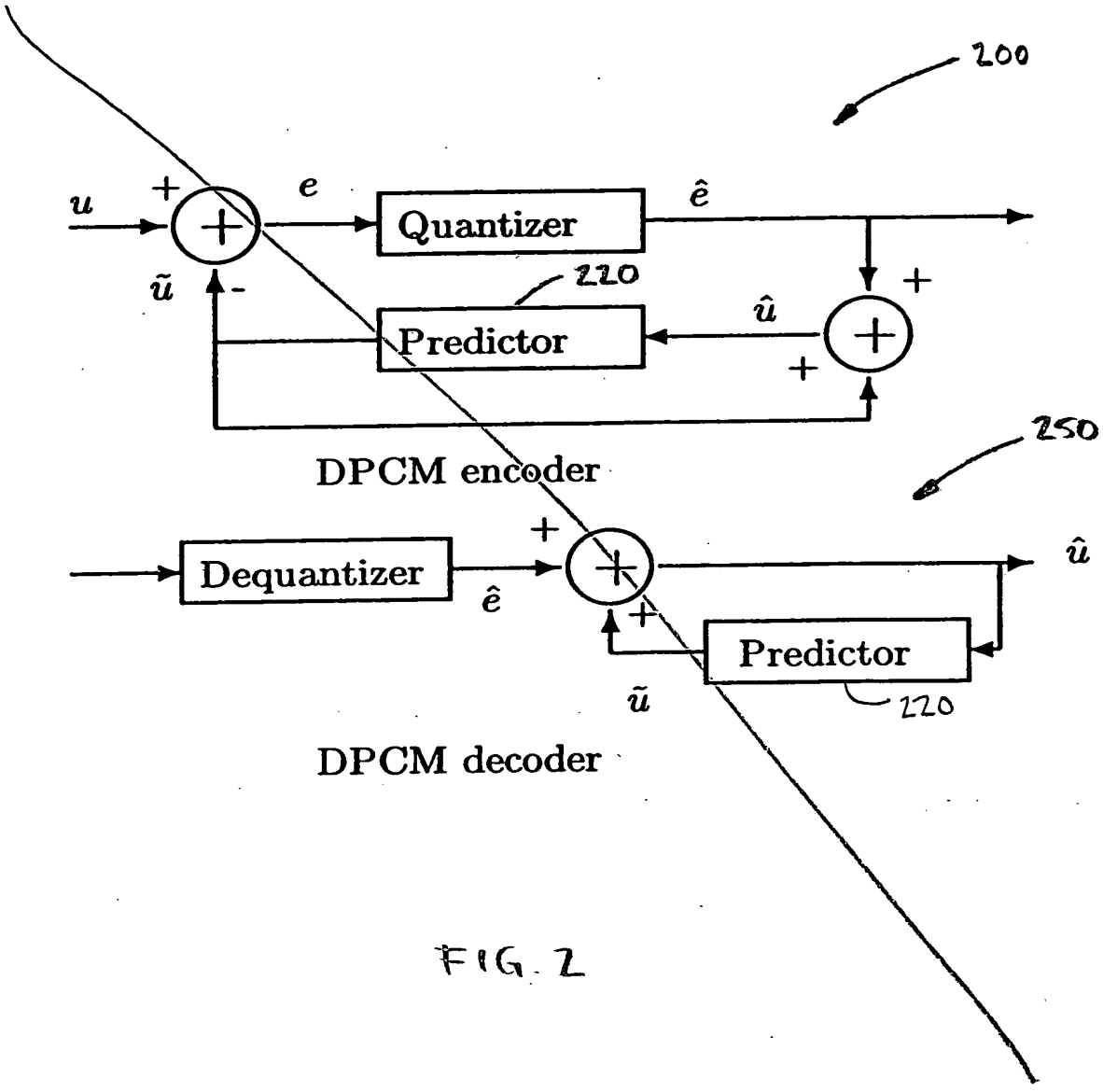
200
u
+
e
Quantizer
ê
ũ
-
220
Predictor
û
+
+
DPCM encoder
250
Dequantizer
+
ê
+
û
Predictor
ũ
220
DPCM decoder

FIG. 2

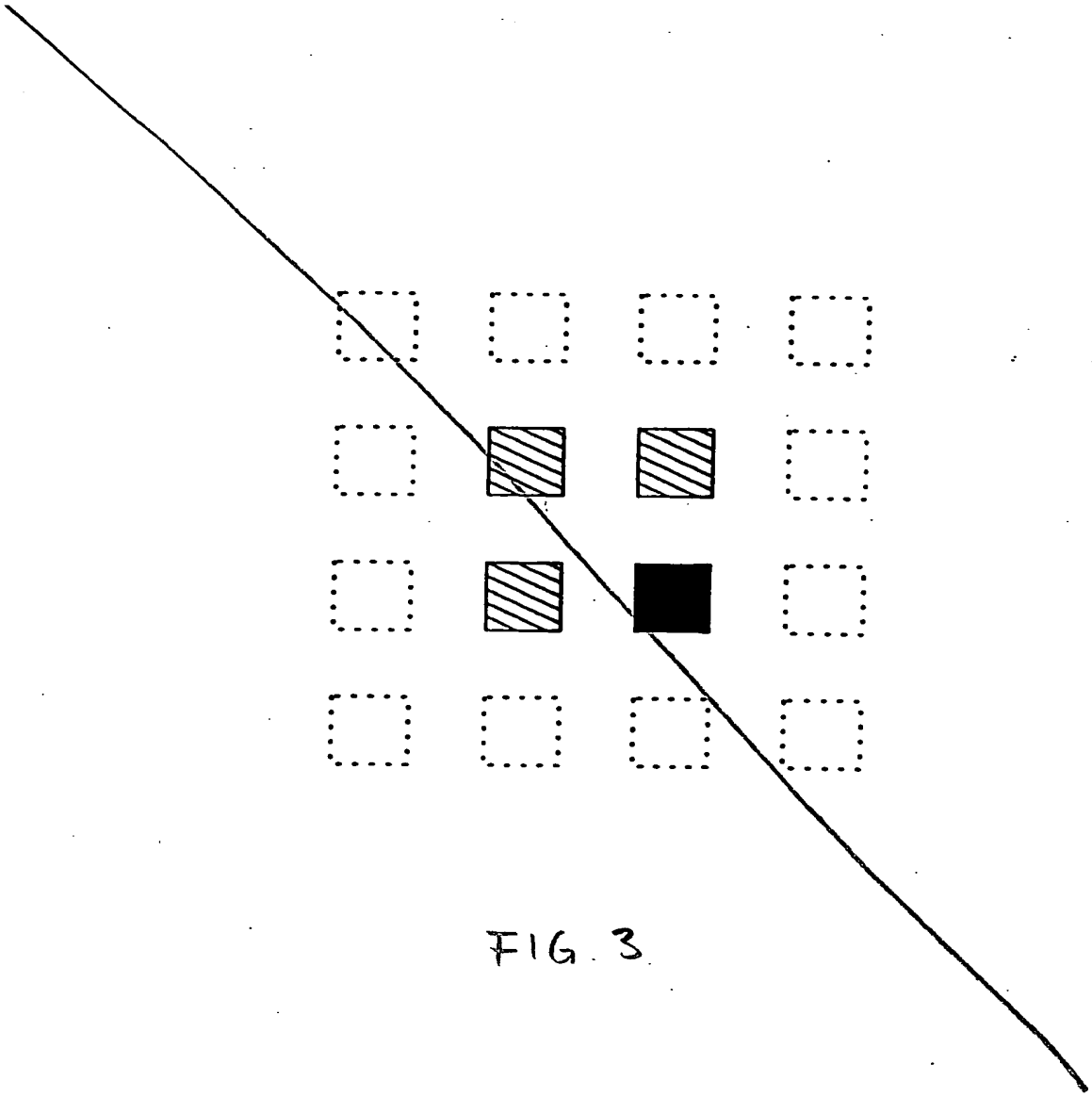

FIG. 3

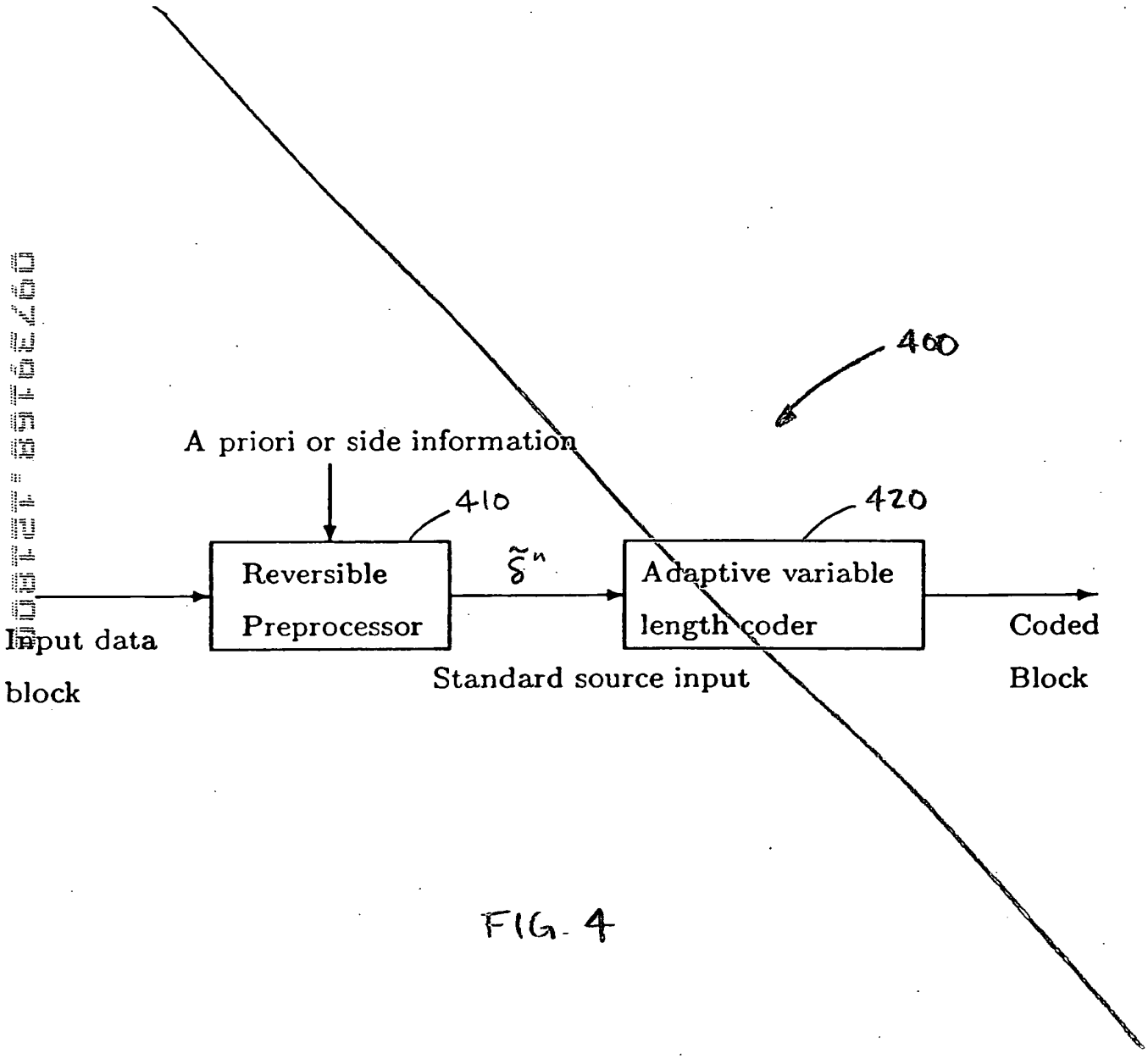
400
A priori or side information
410
420
Reversible
Preprocessor
$\tilde{\delta}^n$
Adaptive variable
length coder
Input data
block
Standard source input
Coded
Block

FIG. 4

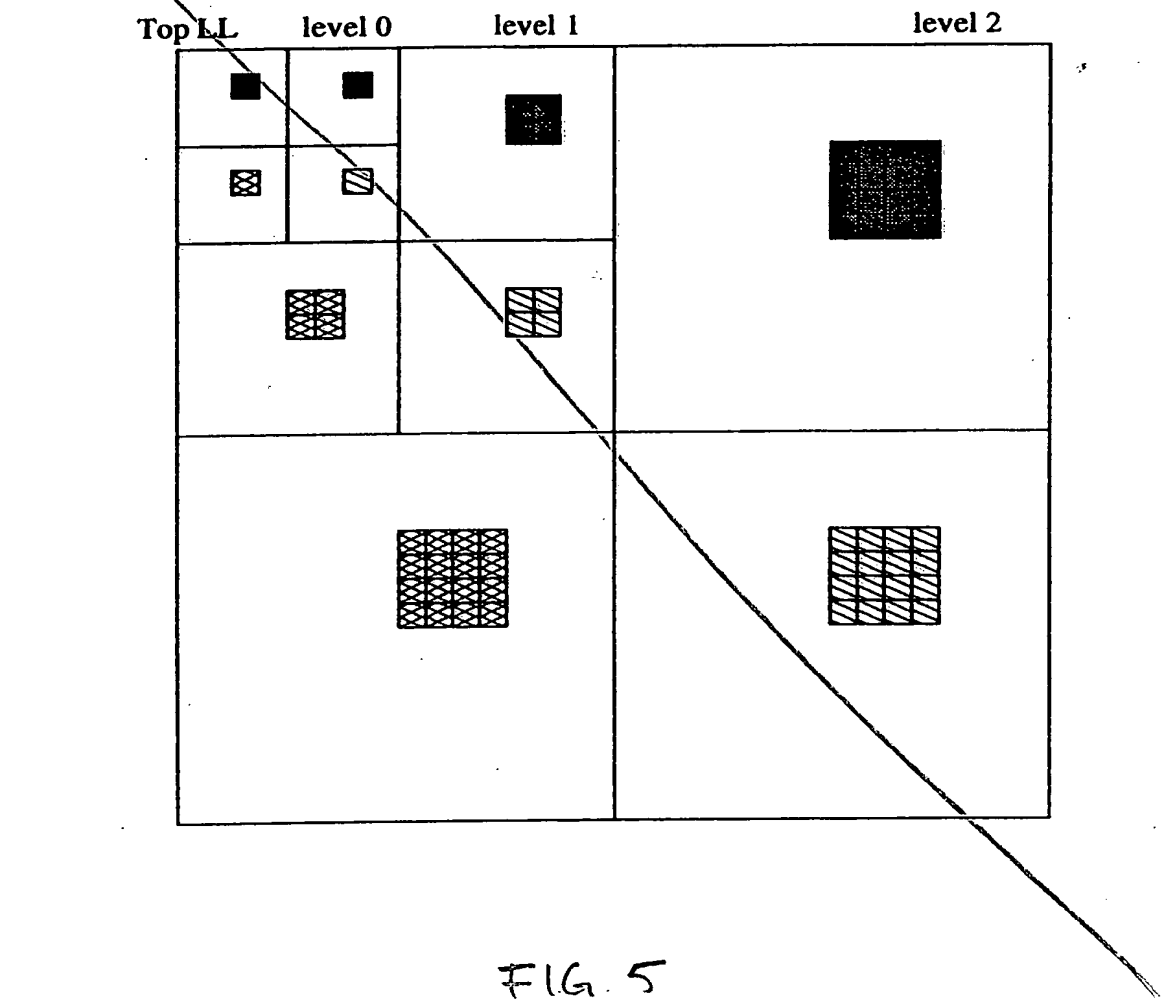

FIG. 5

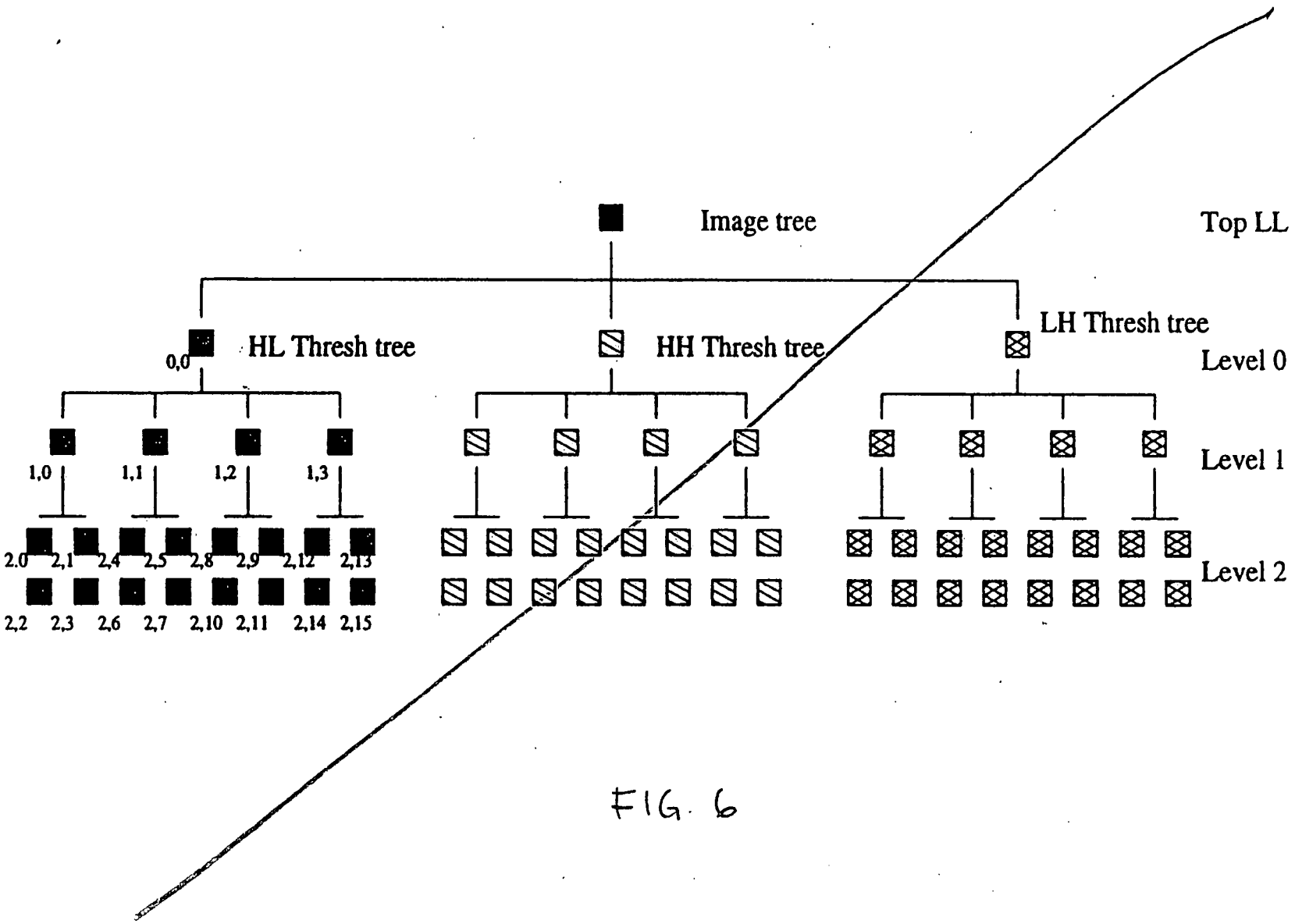

FIG. 6

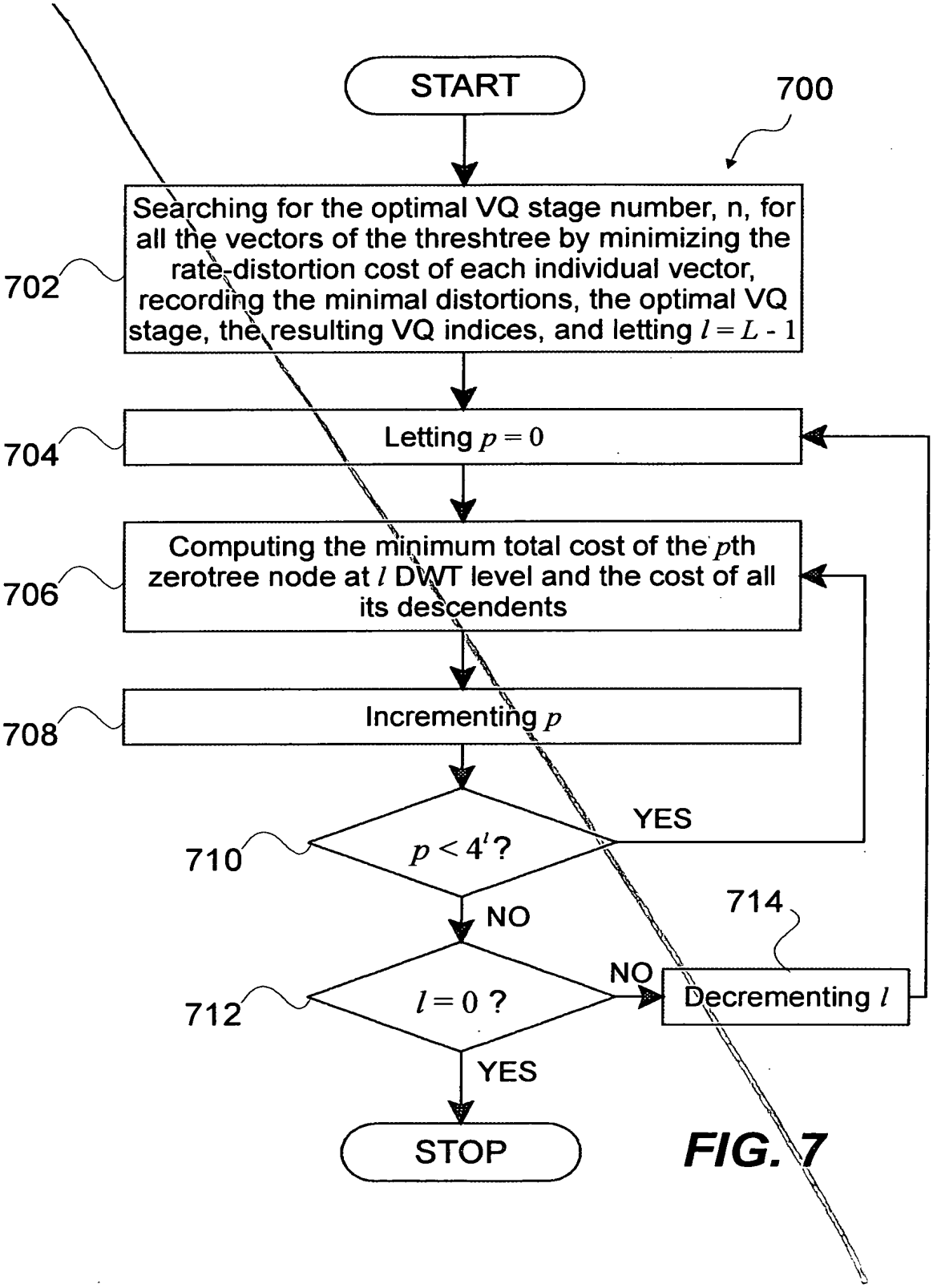
START
700
Searching for the optimal VQ stage number, n, for all the vectors of the threshtree by minimizing the rate-distortion cost of each individual vector, recording the minimal distortions, the optimal VQ stage, the resulting VQ indices, and letting $l = L - 1$
702
Letting $p = 0$
704
Computing the minimum total cost of the pth zerotree node at l DWT level and the cost of all its descendents
706
Incrementing p
708
$p < 4^l$?
710
YES
NO
$l = 0$?
712
NO
Decrementing l
714
YES
STOP

FIG. 7

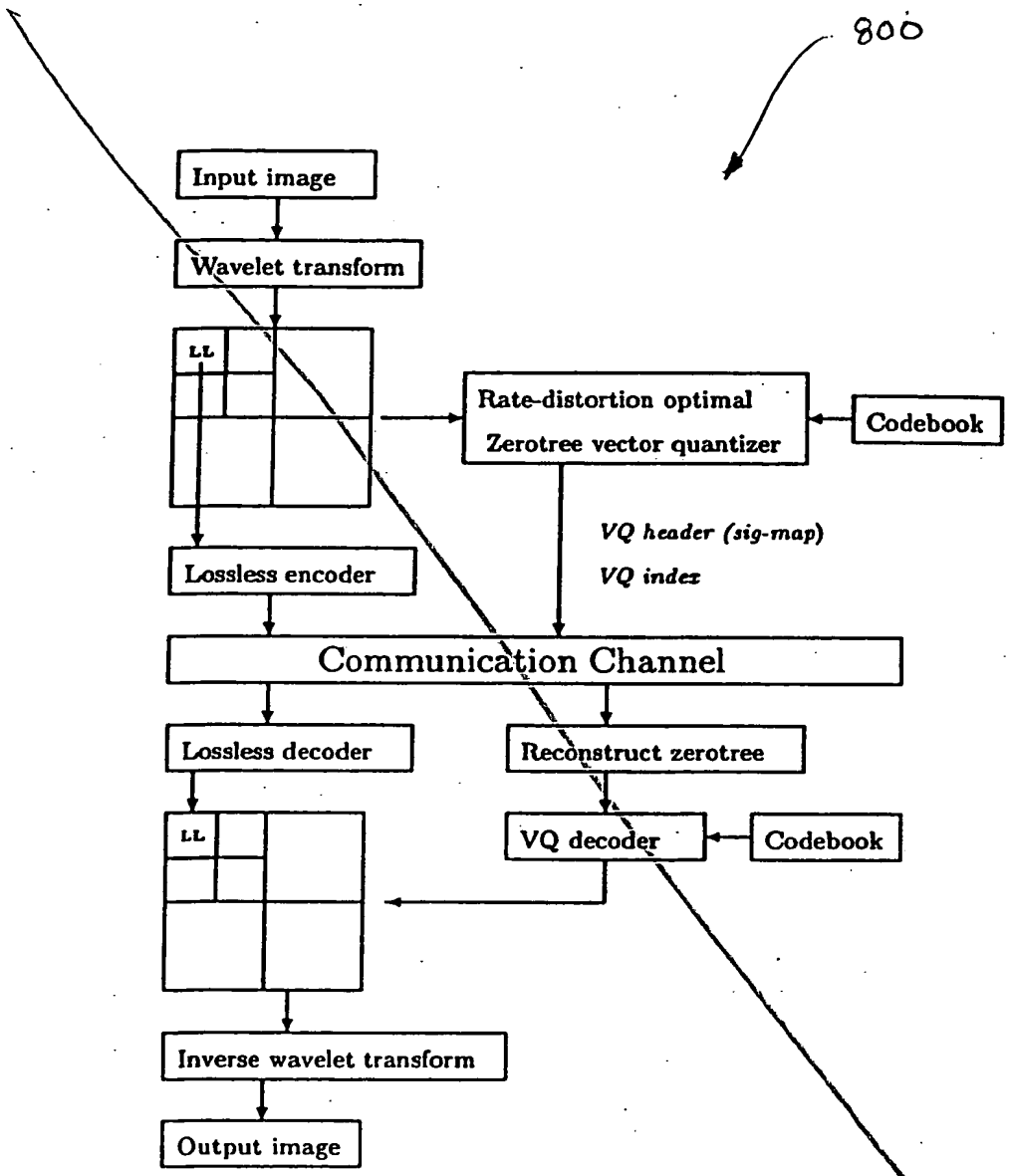
800
Input image
Wavelet transform
LL
Rate-distortion optimal
Zerotree vector quantizer
Codebook
VQ header (sig-map)
VQ index
Lossless encoder
Communication Channel
Lossless decoder
Reconstruct zerotree
LL
VQ decoder
Codebook
Inverse wavelet transform
Output image

FIG. 8

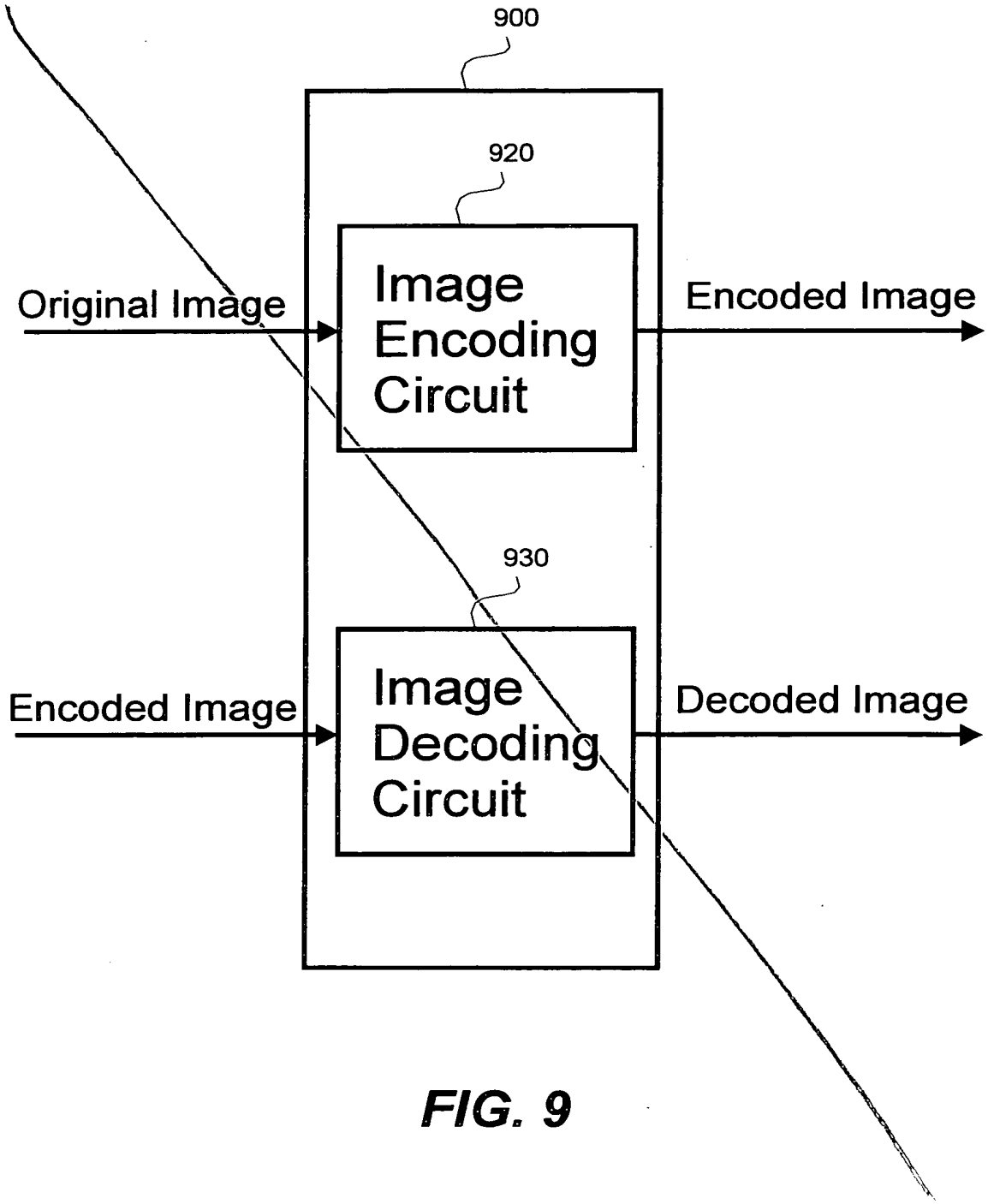
900
920
Image Encoding Circuit
Original Image
Encoded Image
930
Image Decoding Circuit
Encoded Image
Decoded Image

FIG. 9

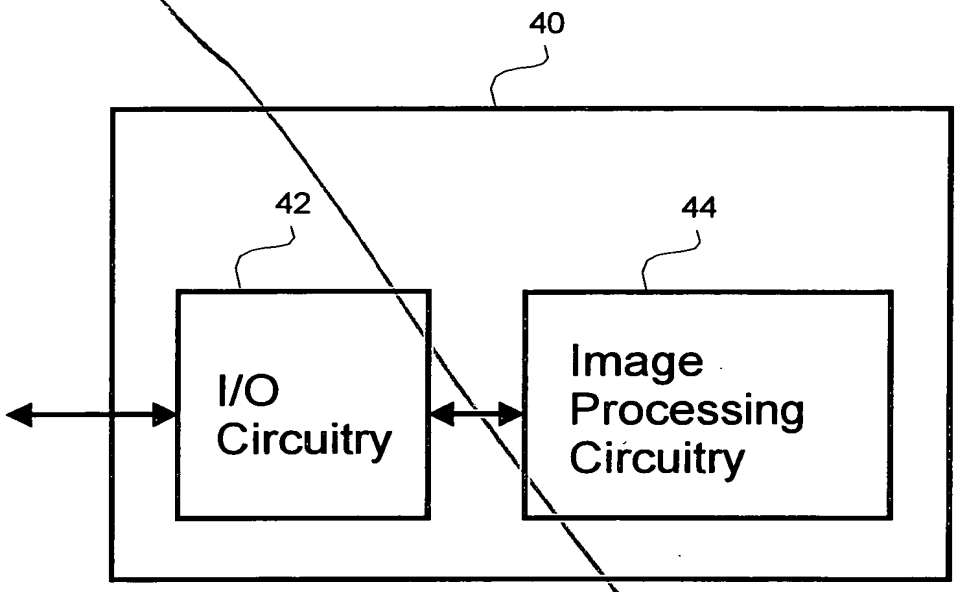

FIG. 10

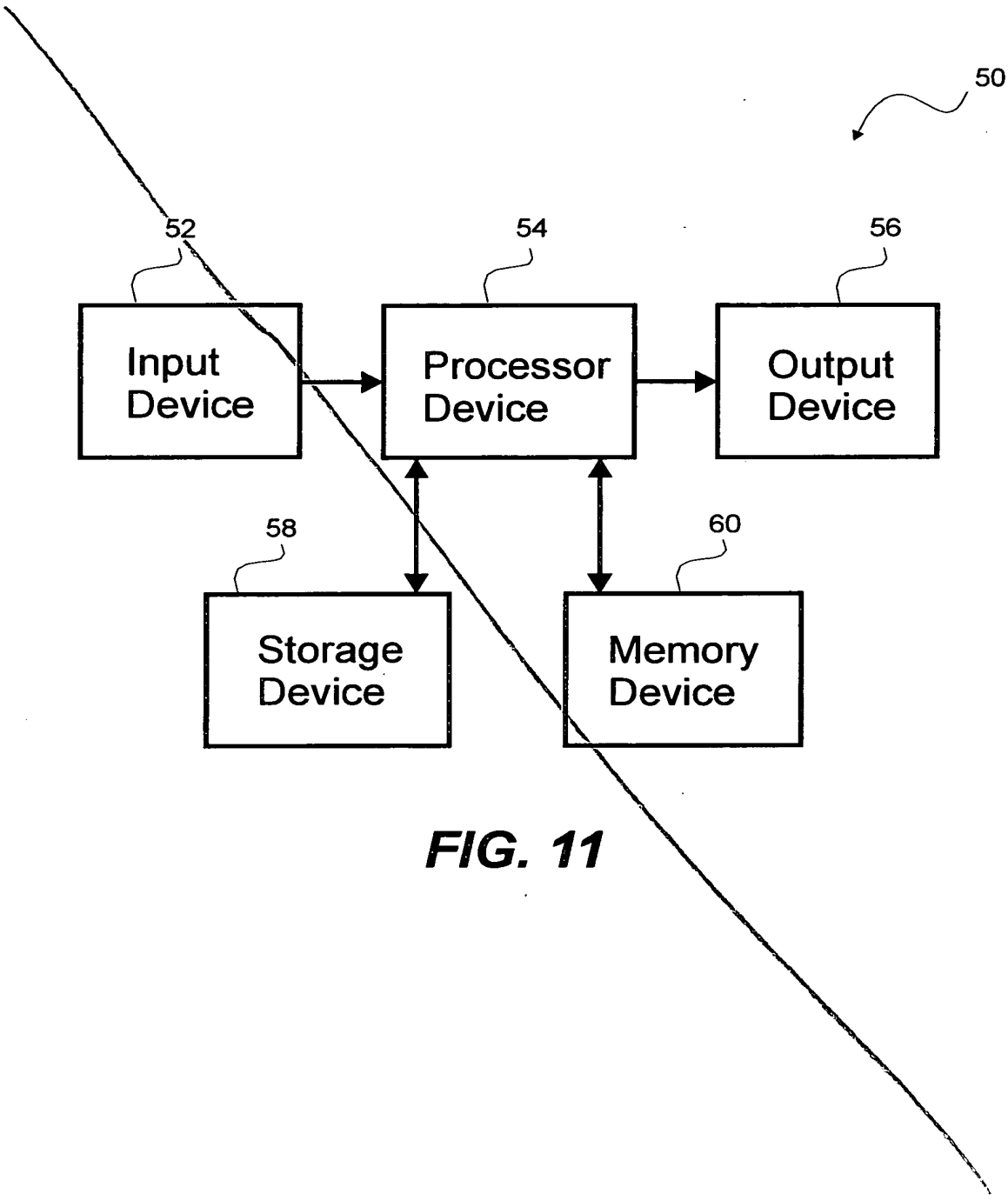
50
52
54
56
Input Device
Processor Device
Output Device
58
60
Storage Device
Memory Device

FIG. 11